

Name: _____

Fire Science/Firefighting

Directions:

Evaluate the student by entering the appropriate number to indicate the degree of competency achieved.

Rating Scale (0-6):

- 0 No Exposure** – no experience/knowledge in this area; program/course did not provide instruction in this area
- 1 Unsuccessful Attempt** – unable to meet knowledge or performance criteria and/or required significant assistance
- 2 Partial Demonstration** – met some of the knowledge or performance criteria with or without minor assistance
- 3 Knowledge Demonstrated** – met knowledge criteria without assistance at least once
- 4 Performance Demonstrated** – met performance criteria without assistance at least once
- 5 Repeated Demonstration** – met performance and/or knowledge criteria without assistance on multiple occasions
- 6 Mastered** – successfully applied knowledge or skills in this area to solve related problems independently

0	1	2	3	4	5	6	A. Describe fire service systems and relationships	Notes:
							1. Identify the organization of the fire department.	
							2. Explain the Fire Fighter I's role as a member of the organization.	
							3. Explain the mission of the fire service and of the local fire department.	
							4. Explain the function of a standard operating procedure.	
							5. Identify the fire department rules and regulations that apply to the position of fire fighter.	
							6. Explain the basic components of incident management and the fire fighter's role within the local incident management system.	
							7. Describe the components of a member assistance program.	
							8. Identify all training resources, record keeping, and testing procedures as they apply to the fire fighter.	
							9. Identify the safety and security restrictions of the training facility, apparatus, and tools.	
							10. Explain the Fire Fighter II's role as a member of the organization.	
							11. Explain the responsibilities of the Fire Fighter II in the assuming and transferring command within the incident management system.	
							Other:	

0	1	2	3	4	5	6	B. Appreciate and apply all personal and workplace safety procedures	Notes:
							1. Demonstrate ability to don personal protective clothing within one minute.	
							2. Demonstrate the ability to doff personal protective clothing and prepare for reuse.	
							3. Demonstrate the ability to hoist tools and equipment using ropes and the correct knot.	
							4. Demonstrate the ability to tie a bowline, clove hitch, figure eight on a bight, halfhitch, becket or sheet bend, and safety knots; and locate information in departmental documents and standard or code materials.	

								5. Illuminate the emergency scene, given fire service electrical equipment and an assignment, so that designated areas are illuminated and all equipment is operated within the manufacturer's listed safety precautions.	
								6. Properly maintain power plants, power tools, and lighting equipment according to manufacturer and departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise.	
								Other:	

0	1	2	3	4	5	6	C. Explain fire theory	Notes:
							1. Understand and explain the definition of fire.	
							2. Identify the components of the fire triangle and the fire tetrahedron.	
							3. Know the three physical stages of fuels.	
							4. Define the different temperature values assigned to the different characteristics of fuels.	
							5. Identify the different sources of heat energy.	
							6. Understand the different units by which heat is measured.	
							7. Identify the classes of fire.	
							8. Explain how heat is transferred.	
							9. Explain how the amount of oxygen can affect a fire.	
							10. Explain the phases through which a fire progresses and the conditions which may develop in those phases.	
							11. Understand how thermal layering occurs in a structure fire and why disturbing this layering of heat should be avoided.	
							12. Know what products of combustion can be found in structural fires and how these products create a life hazard.	
							13. Explain how finely divided fuels can create additional fire hazards.	
							Other:	

0	1	2	3	4	5	6	D. Describe building construction theory	Notes:
							1. Define the basic structural characteristics of the five types of building construction and describe the general fire behavior expected with each.	
							2. Define the basic structural characteristics of the five types of building construction and describe the general fire behavior expected with each.	
							3. Explain dangerous building conditions including indicators of possible building collapse caused by fire and fire suppression activities.	
							4. Identify the hazards that can be expected with truss light-weight construction.	
							5. Explain how fire and fire suppression activities affect different types of building materials.	

								6. Identify standard types of chimneys and flues, and recognize deficiencies likely to cause fires.	
								Other:	

0	1	2	3	4	5	6	E. Interact with alarm and communication systems	Notes:
							1. Understand the procedures for a citizen to report a fire or other emergency according to local procedures.	
							2. Know the procedures for receiving an emergency call and transmitting the alarm to appropriate personnel according to local procedures.	
							3. Identify accepted radio procedures for routine traffic, emergency traffic and emergency evacuation signals.	
							4. Define the purpose and function of all alarm-receiving instruments and personnel-alerting equipment provided.	
							5. Describe procedures and policies concerning manpower, apparatus, special calls, and move-ups during multiple alarm fires according to local procedures.	
							6. Describe business and personal call procedures.	
							7. Demonstrate fire department radio procedures according to prescribed standards or local conditions.	
							8. Identify supervisory alarm equipment and demonstrate action to take upon receipt of an alarm according to local operating conditions.	
							9. Identify fire location indicators provided to direct fire fighters available in the local area.	
							Other:	

0	1	2	3	4	5	6	F. Demonstrate self contained breathing apparatus systems and techniques	Notes:
							1. Demonstrate respiratory hazards and their impact on the human body.	
							2. Demonstrate Self-Contained Breathing Apparatus parts and terminology.	
							3. Identify the physical requirements of the wearer, the limitations of the Self-Contained Breathing Apparatus, and the safety features of all types of Self-Contained Breathing Apparatus.	
							4. Demonstrate donning and doffing of Self-Contained Breathing Apparatus while wearing full protective equipment.	
							5. Demonstrate or identify the procedures for cleaning and sanitizing Self-Contained Breathing Apparatus using approved manufacturer's procedures.	
							6. Know procedures for daily inspection and maintenance of Self-Contained Breathing Apparatus.	
							7. Demonstrate procedures for exchanging air cylinders.	

								8. Demonstrate repositioning of Self-Contained Breathing Apparatus for use in restricted passages.	
								9. Demonstrate emergency procedures while wearing Self-Contained Breathing Apparatus including use of emergency by-pass and breathing from the breathing tube or regulator.	
								10. Demonstrate techniques for conserving the use of air under work conditions.	
								11. Demonstrate the use of Self-Contained Breathing Apparatus in obscured visibility.	
								Other:	

0	1	2	3	4	5	6	G. Demonstrate portable fire extinguisher techniques	Notes:
							1. Know chemistry of fire: match or choose classes of fire with their symbols, list or choose extinguishing principles.	
							2. Know the rating principles for fire extinguishers.	
							3. Know the most common types of extinguishing agents: list or choose the major agents used in the fire service, describe or choose the agents' physical characters, list or choose advantages and limitations of the various agents.	
							4. Know the various types of portable extinguishers and the operating principle of each type of extinguisher.	
							5. Know the basic procedures for proper care and maintenance of portable extinguishers.	
							6. Demonstrate ability to use fire extinguishers.	
							Other:	

0	1	2	3	4	5	6	H. Demonstrate forcible entry techniques	Notes:
							1. Identify forcible entry tools and how to safely carry the following tools: cutting tool, prying tool, pulling tool, and striking tool.	
							2. Demonstrate the safe use of forcible entry tools under direct supervision.	
							3. Identify the methods for cleaning forcible entry tools, inspecting forcible entry tools, and maintaining forcible entry tools.	
							4. Identify features and materials used in building construction.	
							5. Identify the procedures to use in forcing doors, windows, and walls.	
							6. Identify the method and demonstrate the techniques of through the lock entry for doors and windows.	
							7. Demonstrate the proper techniques in forcing doors, windows, and walls.	
							Other:	

0	1	2	3	4	5	6	I. Demonstrate ladder use and maintenance	Notes:
							1. Identify and understand the use of the various types of fire service ladders.	

								2. Demonstrate how to carry, position and raise fire service ground ladders.	
								3. Demonstrate how to climb the full length of fire service ladders while carrying a tool and bring down an injured person.	
								4. Understand how to work from ladders with tools, with and without a safety harness.	
								5. Demonstrate how to use a roof ladder on a pitched roof.	
								6. Identify load capacities for ground and aerial ladders.	
								7. Demonstrate inspection, cleaning and maintenance procedures for different types of ladders.	
								Other:	

0	1	2	3	4	5	6	J. Demonstrate rope use and maintenance	Notes:
							1. Explain the difference between life safety and utility rope.	
							2. Demonstrate the techniques for inspecting rope.	
							3. Demonstrate the proper cleaning, maintenance, and storage of rope.	
							4. Indicate the method of marking a rope to remove it from service.	
							5. Identify the parts of the knot and explain their applications.	
							6. Demonstrate tying each of the following knots: overhand safety, figure of 8 on a bight, becket bend, bowline, clove hitch, halfhitch given the proper size and length of rope.	
							7. Understand when to use the appropriate knot and rope to hoist tools and equipment.	
							8. Select the proper size, material of construction, type of construction, strength, and length of rope for a selected task.	
							9. Select and use rope to tie ladders, hose, and other equipment so as to secure them to immovable objects.	
							10. Select the appropriate knot, given a fire fighting or rescue task.	
							Other:	

0	1	2	3	4	5	6	K. Demonstrate hose, nozzle, and appliance use	Notes:
							1. Understand construction features of fire hose and the application of each size and type of fire hose.	
							2. Understand construction features of fire hose couplings and identify parts and dimensions of selected hose couplings.	
							3. Demonstrate coupling and uncoupling procedures for two lengths of hose.	
							4. Know procedures for basic hose loads.	
							5. Identify from actual load, diagrams, or pictures the various hose loads.	
							6. Demonstrate a minimum of three types of hose loads and finishes.	

								7. Demonstrate a minimum of three hose rolls for each size hose as required in the standard.	
								8. Demonstrate at least two hose carries illustrated in IFSTA Essentials.	
								9. Demonstrate hose, hose coupling and nozzle cleaning, maintenance, and inspection procedures.	
								10. List the four main causes of fire hose injuries.	
								11. Demonstrate procedures for replacing a burst section of hose using the kink or clamp method.	
								12. Demonstrate the use of nozzles, hose adaptors, and hose appliances carried on a pumper.	
								13. Demonstrate procedures for advancing an uncharged and charged attack lines operating as a member of a team.	
								14. Demonstrate procedures for carrying 100 feet of 1 ½ inch or larger attack line into a building and connect to a standpipe and advance the line.	
								15. Demonstrate operating a charged attack line from a ladder.	
								16. Lay 300 feet of supply line 2 ½ inch or larger from a pumper to a water source.	
								17. Demonstrate, select or identify any nozzle and hose combination according to size and usage for fire attack for at least three different fire situations.	
								18. Demonstrate appliance selection based on at least three specific fire ground situations.	
								19. Demonstrate procedures for conducting annual fire hose service test.	
								Other:	

0	1	2	3	4	5	6	L. Demonstrate water supply systems	Notes:
							1. Know the water distribution systems in the local community and identify the parts of a distribution system.	
							2. Identify the different pipe sizes used for residential, business, and industrial areas.	
							3. Identify the causes of increased resistance or friction loss in water mains.	
							4. Identify the types of water main valves.	
							5. Understand the terms static pressure, normal operating pressure, residual pressure, and flow pressure.	
							6. Understand how a dry-barrel hydrant and a wet-barrel hydrant work.	
							7. Demonstrate hydrant to pumper hose connections for both forward and reverse lays.	
							8. Describe and demonstrate connecting a supply hose to a hydrant and operating the hydrant.	
							9. Describe the conditions which reduce hydrant effectiveness.	
							10. Understand how to use a Pitot tube and record flow pressures from different size orifices.	

								11. Know the apparatus, equipment, and appliance necessary for a water shuttle and how to set up a portable water tank and to assemble equipment to transfer water between portable tanks.	
								12. Understand how to load and off-load water from tankers.	
								13. Understand how to assemble and connect drafting equipment for drafting from a static water supply.	
								Other:	

0	1	2	3	4	5	6	M. Demonstrate fire streams	Notes:
							1. Identify the term “fire stream” and the four purposes of a Fire Stream.	
							2. Identify advantages and disadvantages of using water as an extinguishing agent.	
							3. Describe heat absorbing capabilities of water.	
							4. Identify the three types of fire streams and the difference between a straight stream and a solid stream.	
							5. Identify the proper method of water application on the three stages of fire.	
							6. Define the following terms: gpm, psi, friction loss, water hammer, and nozzle reaction.	
							7. Demonstrate how to open and close a nozzle and identify methods of preventing damage to a nozzle and associated equipment.	
							8. Demonstrate proper methods of handling fire streams.	
							9. Identify the safe procedures in the handling of fire hose and directing fire streams.	
							10. Identify the accepted gpm flow from the various sizes and types of nozzles.	
							11. Indicate knowledge of characteristics of various nozzles.	
							12. Define direct, indirect, and combination methods of applying water.	
							13. Indicate knowledge of fire foam application.	
							14. Assemble and operate a foam fire stream arrangement given the appropriate equipment.	
							15. Define the principle of foam generation and define common causes for the poor generation of foam and identify the procedures for correcting each.	
							16. Define the advantages, characteristics, and precautions for use of the various types of foam.	
							Other:	

0	1	2	3	4	5	6	N. Describe ventilation theory as related to fire science	Notes:
							1. Explain the principles of ventilation including advantages and effects of proper ventilation.	
							2. Know the possible dangers present and precautions to take in performing ventilation.	
							3. Understand the indications, causes and effects of a backdraft explosion.	

								4. Know how to prevent a backdraft explosion.	
								5. Describe the advantages and disadvantages of the different types of ventilation.	
								6. Identify the various tools used in ventilation.	
								7. Know the characteristics and precautions required when ventilating various types of roofs.	
								8. Demonstrate how to sound a roof to determine its integrity.	
								9. Describe how different factors can be used to check a roof's integrity.	
								10. Understand the procedures used for the different types of ventilation.	
								11. Demonstrate opening various types of windows with and without tools.	
								12. Demonstrate the correct method for breaking glass and removing obstructions.	
								13. Demonstrate the ventilation of both a pitched and flat roof.	
								14. Identify the various types of manual and automatic venting devices found in structures.	
								15. Understand the operations necessary to control the spread of smoke and fire through duct systems.	
								16. Know the considerations that need to be made to determine the location and size of a ventilation opening.	
								17. Understand the method and precautions used when ventilating a basement.	
								18. Understand the situations when forced ventilation may be required.	
								Other:	

0	1	2	3	4	5	6	O. Demonstrate salvage and overhaul techniques	Notes:
							1. Define the purpose of salvage, and its value to the public and the fire department.	
							2. Identify the types of equipment and tools used for salvage.	
							3. Demonstrate folds and rolls of salvage covers.	
							4. Demonstrate salvage cover throws.	
							5. Describe and demonstrate techniques of inspecting, cleaning, and maintaining salvage equipment.	
							6. Demonstrate the construction and use of a water catch-all.	
							7. Demonstrate debris removal and water routing from a structure using water chutes.	
							8. Demonstrate the ability to protect stationary and movable property from damage.	
							9. Demonstrate the covering or closing of openings made during fire fighting operations.	
							10. Know the purpose of overhaul.	
							11. Identify hazards associated with overhaul operations and the appropriate safety equipment and clothing for performing overhaul activities.	

								12. Recognize at least four indicators of hidden fires.	
								13. Demonstrate techniques for opening walls, ceilings, and floors, and pulling apart burned materials.	
								14. Demonstrate how to separate, remove, and relocate charred materials.	
								15. Identify duties of fire fighters left at the fire scene for fire and security surveillance.	
								16. Describe factors that influence the structural stability of a building.	
								17. Explain the methods of protecting and preserving evidence during overhaul operations.	
								18. Identify the procedures for restoration of the premise after a fire.	
								Other:	

0	1	2	3	4	5	6	P. Describe sprinkler system theory and application	Notes:
							1. Define the value of automatic sprinklers.	
							2. Identify the components of an automatic sprinkler system and their functions.	
							3. Identify the major sprinkler systems and describe their operation.	
							4. Identify and demonstrate the actions required for fire department support of an automatic sprinkler system.	
							5. Connect a fire department pumper to the fire department connection.	
							6. Operate a main control valve from open to closed and back to open.	
							7. Temporarily stop the flow of water from a sprinkler head.	
							8. Identify and demonstrate the procedures for inspecting and automatic sprinkler system in order to determine the systems state of readiness.	
							9. Read and record the pressure on all gauges provided on a wet pipe system and identify each gauge.	
							Other:	

0	1	2	3	4	5	6	Q. Demonstrate emergency medical care	Notes:
							1. Define the principles of infection control and universal blood and body fluid precautions as prescribed for public safety workers.	
							2. Demonstrate the use of personal protective equipment used for protection from infection.	
							3. Demonstrate the decontamination and disinfection of personal protective equipment used for protection from infection.	
							4. Demonstrate the proper disposal of equipment used for personal protection from infection	
							5. Perform the single-rescuer CPR, two-rescuer CPR, and management of an obstructed airway.	
							6. Identify steps in a primary survey.	

								7. Identify three types of external bleeding and characteristics and demonstrate techniques for controlling external bleeding.	
								8. Identify characteristics of thermal burns and demonstrate procedures for handling thermal burns according to recognized procedures.	
								9. Identify symptoms and demonstrate emergency medical care of traumatic shock.	
								10. Identify the symptoms and demonstrate emergency medical care for ingested poisons and drug overdoses.	
								11. Identify the method of contacting the poison control center that serves the local jurisdiction.	
								Other:	

0	1	2	3	4	5	6	R. Demonstrate rescue techniques	Notes:
							1. Explain and demonstrate primary and secondary search procedures for victims in fire conditions with and without a rope or hoseline	
							2. Demonstrate rescue operations for fire fighters both with and without functioning self-contained breathing apparatus and civilians with respiratory protection	
							3. Understand and demonstrate how to remove injured persons using carriers, drags and stretchers.	
							4. Describe and demonstrate extrication operations for victims of motor vehicle accidents.	
							5. Explain rescue and safety techniques for the following: structural collapses, trench rescues, canes and tunnels, water and ice emergencies, elevators and escalators, energized electrical lines, industrial accidents, other local hazards.	
							6. Understand and operate the following rescue tools: cribbing and shoring materials, block and tackle, hydraulic equipment, pneumatic equipment, ratchet device.	
							Other:	

0	1	2	3	4	5	6	S. Demonstrate fire control techniques	Notes:
							1. Explain the procedures involved with the extinguishment of the following types of fires: piles of combustible materials, ignitable liquids, vehicle fires, storage containers, combustible materials within a structure, ground cover, flammable gas cylinders.	
							2. Extinguish and control the following types of fires: piles of combustible materials, vehicle fires, storage containers, combustible materials within a structure, ground cover.	
							3. Extinguish and control the following types of fires: exterior combustible liquid fire using foam, a fire in an elevated location in a structure, a hidden fire in a structure, a fire involving energized electrical equipment, a fire involving a flammable gas cylinder.	
							4. Coordinate an interior attack in a structural fire.	

								Other:	
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0	1	2	3	4	5	6	T. Identify and document fire cause evidence	Notes:
							1. Identify the responsibilities of the fire fighter in determining the point of origin of a fire and the basic steps to accomplish this task.	
							2. Identify the reasons for determining the cause of fires.	
							3. Identify the fire fighter's role and responsibility in the protection of evidence of fire causes	
							4. Locate the fire's area of origin, identify and preserve fire cause evidence.	
							Other:	

0	1	2	3	4	5	6	U. Demonstrate hazardous material awareness	Notes:
							1. Describe the role of the first responder in a hazardous material incident and identify related training requirements.	
							2. Identify and describe the important laws, regulations, and standards that apply to hazardous materials initial response.	
							3. Identify the hazard class and, if possible, the product name of hazardous materials found at an emergency scene.	
							4. Apply principles and define terminology to ensure personal safety.	
							5. Identify the characteristics which may involve hazardous materials in terroristic activities.	
							Other:	

0	1	2	3	4	5	6	V. Conduct hazardous material operations	Notes:
							1. Demonstrate an understanding of the role of the first responder operations level given a hazardous materials scenario.	
							2. Identify the containers and materials involved, determine whether hazardous materials have been released, and evaluate the surrounding conditions given examples of both facility and transportation scenarios involving hazardous materials.	
							3. Successfully collect hazard and response information using materials safety data sheets (MSDS), CHEMTREC/CANUTEC/SETIQ, and contacts with the shipper/manufacture, given known hazardous materials.	
							4. Demonstrate ability to predict the likely behavior of the material and its container given a single hazardous material.	
							5. Successfully estimate the potential harm within an endangered area provided a simulated incident involving hazardous materials.	
							6. Describe the first responder operations level response objectives for each problem given at least two scenarios involving hazardous materials incidents (one facility and one transportation).	
							7. Identify the defensive options for each response objective given simulated facility and transportation hazardous materials problems.	

								8. Successfully determine whether available protective equipment is appropriate for implementing a defense option provided the name of a hazardous material involved and the anticipated type of exposure.	
								9. Identify emergency decontamination procedures given a plan of action for a hazardous materials incident.	
								10. Identify how to establish and enforce scene control including control zones, emergency decontamination and communications provided scenarios for facility and transportation hazardous materials incidents.	
								11. Initiate the incident management system specified in the local emergency response plan and the organizations standard operating procedure given a simulated facility and transportation hazardous material incident.	
								12. Demonstrate the ability to don, work in and doff the personal protective clothing, provided personal protective equipment representative of that provided by the authority having jurisdiction.	
								13. Demonstrate defensive control actions set out in the plan given a plan of action for a hazardous materials incident within their capabilities.	
								14. Evaluate the status of the defensive actions taken in accomplishing the response objectives provided a simulated facility or transportation hazardous material incident.	
								15. Communicate the status of the planned response to the incident commander and other response personnel given a simulated facility or transportation incident.	
								16. Utilize the monitoring equipment to assess the presence of hazardous materials given a simulated hazardous materials incident.	
								Other:	

0	1	2	3	4	5	6	W. Analyze threats using fire prevention techniques	Notes:
							1. Identify five common causes of fires and their prevention.	
							2. Define the importance of inspection and public fire education programs to public relations and the community.	
							3. Demonstrate inspection procedures for private dwellings.	
							4. Present a prepared fire education program to an identified audience, given a lesson plan, time allotment and instructional materials.	
							5. Document the presentation of a program from Behavioral Objective 4, given a reporting form that includes program title, number of participants and evaluations.	
							6. Prepare surveys of buildings to record the location of items of concern during pre-fire planning operations.	
							7. Conduct a building survey and prepare a written report.	

								8. Identify school exit drill procedures.	
								9. Identify life safety programs for the home.	
								10. Identify common fire hazards and make recommendations for their correction.	
								11. Identify smoke, flame and heat-detection alarm systems.	
								12. Identify the fire hazards commonly found in manufacturing, commercial, residential, and public assembly occupancies.	
								Other:	

0	1	2	3	4	5	6	X. Demonstrate leadership skills in the classroom, industry, and society	Notes:
							1. Demonstrate an understanding of Skills USA/VICA, its structure, and activities.	
							2. Demonstrate an understanding of one's personal values.	
							3. Perform task related to effective personal management.	
							4. Demonstrate interpersonal skills.	
							5. Demonstrate etiquette and courtesy.	
							6. Demonstrate effectiveness in oral and written communication.	
							7. Develop and maintain a code of professional ethics.	
							8. Maintain a good professional appearance.	
							9. Perform basic task related to securing and terminating employment.	
							10. Perform basic parliamentary procedures in a group meeting.	
							Other:	